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ABSTRACT

An enrollment-driven model for estimating instructional costs is presented in this paper as developed by the Western Interstate Commission for Higher Education (WICHE). After stating the principles of the WICHE planning system (i.e., various categories of data are gathered, segmented, and then cross-tabulated against one another to yield certain measures of "resource productivity" and cost), an example of the application of the model for a fictitious institution, XYZ Community College, is presented. Summaries of the fall semester enrollment data; student enrollment by division and student contact hours by division; and faculty salaries by division are presented first, followed by projections of (1) direct faculty costs per student contact hour (SCH), as determined by dividing the division costs by the total SCH's in each division; (2) division student workload, as determined by dividing SCH's in each division by the number of faculty members in that division; and (3) faculty staffing adjustments to correct variances. Concluding comments discuss possible applications of the cost estimation model in studying the implications of alternative instructional and programmatic decisions. (LAL)

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AN INSTRUCTIONAL COST ESTIMATION MODEL

FOR

THE XYZ COMMUNITY COLLEGE

December 1986

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December, 1986

AN INSTRUCTIONAL COST ESTIMATION MODEL
FOR
THE XYZ COMMUNITY COLLEGE

During the 1960's a cost estimation model was developed by the Western Interstate Commission for Higher Education (WICHE). The model has been used at a limited number of institutions as a tool in long-range planning and financial decision making, however, the model described in this article, a simplified version for a Community College of approximately 1100 students, can be a useful tool for projecting faculty needs.

The principles of the WICHE planning system are simple: various categories of data are gathered, segmented, and then cross-tabulated against one another to yield certain measures of "resource productivity" and cost. The value of the model rests on the usefulness of these productivity and cost measurements in making financially related educational policy decisions.

The WICHE cost estimation model is "enrollment driven"; that is, the primary category of data input relies on enrollment projections by cost center.

The XYZ Community College, (a fictitious institution) in devising a workable version of the WICHE model used "divisions" as cost centers because budgets are allocated by division. The following summaries have been prepared for the XYZ Community College:

1. Fall Semester Enrollment Data - Exhibit 1 (The College is funded for the year based on its fall semester enrollment).

2. Student Enrollment by Division and Student Contact Hours by Division - Exhibit 2

3. Faculty Salaries by Division - Exhibit 3

The model is then designed to provide projections of:

1. Direct Faculty Costs Per Student Contact Hour for each division - Exhibit 4

2. Division Student Workload Analysis and the variances by division from desired faculty "productivity" levels - Exhibit 5

3. Faculty Staffing Adjustments to Correct Variances - These are "hiring" or "reduction" suggestions, by division, to correct division workload inequities - Exhibit 6

The first model output which appears in EXHIBIT 2 presents actual total student enrollment in each division during the fall semester, 1985. In addition, the actual student contact hours per week which faculty are scheduled to meet students is indicated.

EXHIBIT 3 presents the total salary amounts to be paid faculty in each of the eleven divisions. (Salary figures by individual are not presented, only the totals by division.)

EXHIBIT 4 presents direct faculty costs per student contact hour. This was determined by dividing the division costs in EXHIBIT 3 by the total student contact hours in each division presented in EXHIBIT 2.

EXHIBIT 5 presents work load by division. It was determined by dividing student contact hours in each division from EXHIBIT 2 by the number of faculty members in each respective division. In this example, note that the Social Science Division has a relatively heavy student load while the Band and Physical Education Divisions have a relatively light student load.)

The final model output, EXHIBIT 6, presents a schedule of staffing requirements by division. These were determined by dividing the fall semester student contact hours per week by the recommended contact hours presented at the bottom of EXHIBIT 6. The contact hours per division presented are arbitrary figures and will vary from institution to institution. This schedule was prepared to arrive at instructor requirements by division. The current number of instructors in each division are subtracted from the "teaching requirements" to derive the hiring (or "reduction") requirements to bring each division in line with the desired faculty load and productivity rations.

This model is by no means a panacea. Factors other than cost must be considered on an institution by institution basis, however, it can be useful in predicting future staffing needs as a college attempts to set "institutional goals" 12 to 15 months in advance.

INSTRUCTIONAL
COST ESTIMATION MODEL
1985-86

EXHIBIT 1

XYZ COMMUNITY COLLEGE

BASIC DATA

FALL SEMESTER ENROLLMENT

	FULL TIME FRESHMEN	FULL TIME SOPHOMORE	TOTAL	PART TIME FRESHMEN	PART TIME SOPHOMORE	TOTAL
ACADEMIC	492	368	860	25	39	64
TECHNICAL	114	151	265	03	24	27
TOTALS			1,125			91

FACULTY:

Total Full Time Faculty - 69
Faculty/Student Ratio - 16.3 (1125 students / 69 instructors = 16.3 students/instructors)

ANNUAL TUITION:

$500.00

MINIMUM FULL-TIME EQUIVALENT STUDENT COURSE LOAD:

12 Semester hrs. - 4-three semester hours courses

EXHIBIT 2

ENROLLMENT PROJECTIONS BY DIVISION (Contact hours)
(1 contact hour = 1 class hr. per student per week)

DIVISIONS

FALL 1985

DIVISION	ENROLLMENT	STUDENT CONTACT HOURS PER WEEK	TOTALS
Dev. Studies Division	306	924	924
Technology Division	570	2,197	2,197
Business Admin. Division	505	1,784	1,784
Communications Division	844	2,535	2,535
Fine Arts Division	544	1,796	1,796
Band Division	201	590	590
A.D. Nursing Division	185	2,294	2,294
Physical Education Div.	209	546	546
Math & Computer Sci. Div.	779	2,359	2,359
Natural Science Division	1,283	2,944	2,944
Social Science Division	1,208	3,614	3,614
TOTALS	6,634	21,583	21,583

EXHIBIT 3

1985-86
*FACULTY SALARIES BY DIVISION

DIVISION	TOTAL
Dev. Studies Division	$ 65,405
Technology Division	302,636
Business Administration Division	102,374
Communications Division	140,072
Fine Arts Division	156,540
Band Division	69,438
A.D. Nursing Division	349,416
Physical Education Division	78,243
Math & Computer Science Division	129,792
Natural Science Division	160,837
Social Science Division	162,259

*Determined by summing the salaries of all faculty in each respective division.

EXHIBIT 4

1985-86

*DIRECT FACULTY COSTS PER STUDENT CONTACT HOUR

BY DIVISION

DIVISION	FALL AVERAGE
Dev. Studies Division	$ 70.78
Technology Division	137.75
Business Administration Division	57.38
Communications Division	55.25
Fine Arts Division	87.16
Band Division	117.69
A.D. Nursing Division	151.01
Physical Education Division	143.30
Math & Computer Science Division	55.02
Natural Science Division	54.63
Social Science Division	44.90
FALL AVERAGE	$ 88.62

*Calculated by dividing total faculty salaries in each division by the total student contact hours in each division.

EXHIBIT 5

1985-86
*DIVISION STUDENT WORKLOAD ANALYSIS

DIVISION	*STUDENT CONTACT HOURS	**NUMBER OF FACULTY IN EACH DIVISION	TOTAL
Dev. Studies Division	924	03	308
Technology Division	2,197	12	183
Business Admin. Division	1,784	05	357
Communications Division	2,535	6.5	390
Fine Arts Division	1,796	09	225
Band Division	590	03	197
A.D. Nursing Division	2,294	15	153
Physical Education Division	546	03	182
Math & Computer Sci Division	2,359	05	472
Natural Science Division	2,944	08	368
Social Science Division	3,614	7.5	482

Calculated by dividing *student contact hours in each division by the **number of faculty in each division.

EXHIBIT 6

XYZ COMMUNITY COLLEGE
FACULTY STAFFING ADJUSTMENTS TO CORRECT VARIANCES
FOR 1986-87

DIVISIONS	*TEACHING REQUIREMENTS	CURRENT # INSTRUCTORS	HIRING (REDUCTION) DIFFERENCE	HIRING ADDITIONS (REDUCTION) SUGGESTIONS
Dev. Studies Division	3.08	03	.08	0
Technology Division	7.32	12	(4.68)	-4.5
Business Admin. Div.	4.76	05	(.24)	0
Communications Div.	6.76	6.5	(.26)	0
Fine Arts Division	5.96	08	(2.02)	-2
Band Division	1.57	03	(1.43)	-1.5
A.D. Nursing Div.	15.29	15	.29	0
Physical Ed. Div.	1.46	03	(1.54)	-1.5
Math & Computer Sci. Div.	6.29	05	1.29	1
Natural Science Div.	8.18	08	.18	0
Social Science Div.	8.03	7.5	.53	-.5

*Calculated by dividing the 1985 fall semester student contact hours per week by the recommended contact hour per instructor listed below:

DEV. STUD.	**20 students X 5 classes X 3 contact hrs per class = 300
TECH	**20 students X 5 classes X 3 contact hrs per class = 300
BUSINESS	**25 students X 5 classes X 3 contact hrs per class = 375
COMMUNIC.	**25 students X 5 classes X 3 contact hrs per class - 375
FINE ARTS	**20 students X 5 classes X 3 contact hrs per class = 300
BAND	**25 students X 5 classes X 3 contact hrs per class = 375
NURSING	**10 students X 5 classes X 3 contact hrs per class = 150
P.E.	**25 students X 5 classes X 3 contact hrs per class = 375
MATH	**25 students X 5 classes X 3 contact hrs per class = 375
NAT. SCI.	**24 students X 5 classes X 3 contact hrs per class = 360
SOC. SCI.	**30 students x 5 classes x 3 contact hrs per class = 450

**Reflects the average number of students per class in each division. These figures may vary from institution to institution.

Instructional Administrators seriously interested in minimizing the costs of providing instruction should find a number of possible applications of the cost estimation model. Potential problems in perfecting such a model will also become obvious, for factors other than costs must be taken into consideration when planning a quality instructional program.

This cost estimation model will be of greatest use in studying the implications of alternate decisions which might be implemented. It should, however, be a useful tool in exploring alternatives for decision making and in providing supporting evidence for a decision(s) which is ultimately made relative to needed faculty positions within an institution.

William F. Edmonson has served for 12 years as Dean of Instructional Affairs at Itawamba Junior College, Fulton, MS. He previously served in community colleges in North Carolina and Florida. He has the Ed.D. in higher education administration from the University of Mississippi.

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